

*Amendments to the Claims**

This listing of claims will replace all prior versions, and listings of claims in the application.

1-37. (cancelled)

¹ ~~38.~~ (currently amended) An isolated nucleic acid molecule comprising a polynucleotide selected from the group consisting of:

a. a polynucleotide sequence encoding a polypeptide comprising amino acids from about 1 to about 689 in SEQ ID NO:85;

b. a polynucleotide sequence encoding a polypeptide comprising amino acids from about 1 to about 689 in SEQ ID NO:86;

c. a polynucleotide sequence encoding a polypeptide that is at least 95% identical to the polynucleotide sequence of (a) or (b); and

d. a polynucleotide sequence fully complementary to the polynucleotide sequence of (a), (b) or (c) encoding a polypeptide.

wherein said polypeptide methylates DNA in an *in vitro* assay.

² ~~39.~~ (previously presented) The nucleic acid molecule of claim ¹~~38~~, wherein said polynucleotide is that of part (a).

³ ~~40.~~ (previously presented) The nucleic acid molecule of claim ¹~~38~~, wherein said polynucleotide is that of part (b).

* The claims presented here, presume that the Amendment filed March 20, 2007 was entered.

~~4~~ 41. (previously presented) The nucleic acid molecule of claim ~~38~~¹, wherein said polynucleotide is that of part (c).

~~5~~ 42. (previously presented) The nucleic acid molecule of claim ~~38~~¹, wherein said polynucleotide is that of part (d).

43-44. (cancelled)

~~6~~ 45. (previously presented) A method of making a recombinant vector comprising inserting an isolated nucleic acid molecule of Claim ~~38~~¹ into a vector selected from a group consisting of:

- a. a DNA vector; and
- b. an RNA vector.

~~7~~ 46. (previously presented) A recombinant vector comprising the isolated nucleic acid molecule of Claim ~~38~~¹.

~~8~~ 47. (currently amended) A method of making [[a]] an isolated recombinant host cell comprising introducing the recombinant vector of Claim ~~46~~⁷ into [[a]] said host cell.

~~9~~ 48. (currently amended) [[A]] An isolated recombinant host cell comprising the vector of Claim ~~46~~⁷.

¹⁰
~~49.~~ (currently amended) A method for producing a *de novo* DNA cytosine methyltransferase polypeptide, comprising culturing the isolated recombinant host cell of Claim ⁹~~48~~ under conditions such that said polypeptide is expressed and recovering said polypeptide.

50. (cancelled)

¹¹
~~51.~~ (currently amended) An isolated nucleic acid molecule comprising a polynucleotide selected from the group consisting of:

- a. a polynucleotide sequence encoding mouse Dnmt3a2 polypeptide contained in ATCC Deposit No. PTA-4611;
- b. a polynucleotide sequence encoding human DNMT3A2 polypeptide contained in ATCC Deposit No. PTA-4610;
- c. a polynucleotide sequence encoding a polypeptide at least 95% identical to the polynucleotide sequence of (a) or (b); and
- d. a polynucleotide sequence fully complementary to the polynucleotide sequence of (a), (b) or (c) encoding a polypeptide.

wherein said polypeptide methylates DNA in an *in vitro* assay.

¹²
~~52.~~ (previously presented) The nucleic acid molecule of claim ¹¹~~51~~, wherein said polynucleotide is that of part (a).

¹³
~~53.~~ (previously presented) The nucleic acid molecule of claim ¹¹~~51~~, wherein said polynucleotide is that of part (b).

¹⁴
~~54.~~ (previously presented) The nucleic acid molecule of claim ¹¹~~51~~, wherein said polynucleotide is that of part (c).

¹⁵
~~55.~~ (previously presented) The nucleic acid molecule of claim ¹¹~~51~~, wherein said polynucleotide is that of part (d).

¹⁶
~~56.~~ (previously presented) The nucleic acid molecule of claim ¹~~38~~, wherein said nucleic acid molecule is expressed in embryonic stem cells.

¹⁷
~~57.~~ (previously presented) The nucleic acid molecule of claim ¹¹~~51~~, wherein said nucleic acid molecule is expressed in embryonic stem cells.